



**CATENA**  
NETWORKS

# Catena Company Overview

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R&D Center in Ottawa, Canada



- Privately held company
- Headquartered in Redwood Shores, CA
- More than 300 employees in the U.S. and Canada
- **U.S. \$192 million in venture capital financing**
  - Goldman Sachs, J. & W. Seligman, Munder Capital Management, WestAM, Morgenthaler, Menlo, Worldview, Bessemer, JP Morgan, Berkeley, BCE, Lighthouse, Silicon Valley Bank

# The Goal!

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## 1 Delivery of Voice, Data and Video Services

- Make broadband (ADSL) as affordable, available and ubiquitous as POTS is today

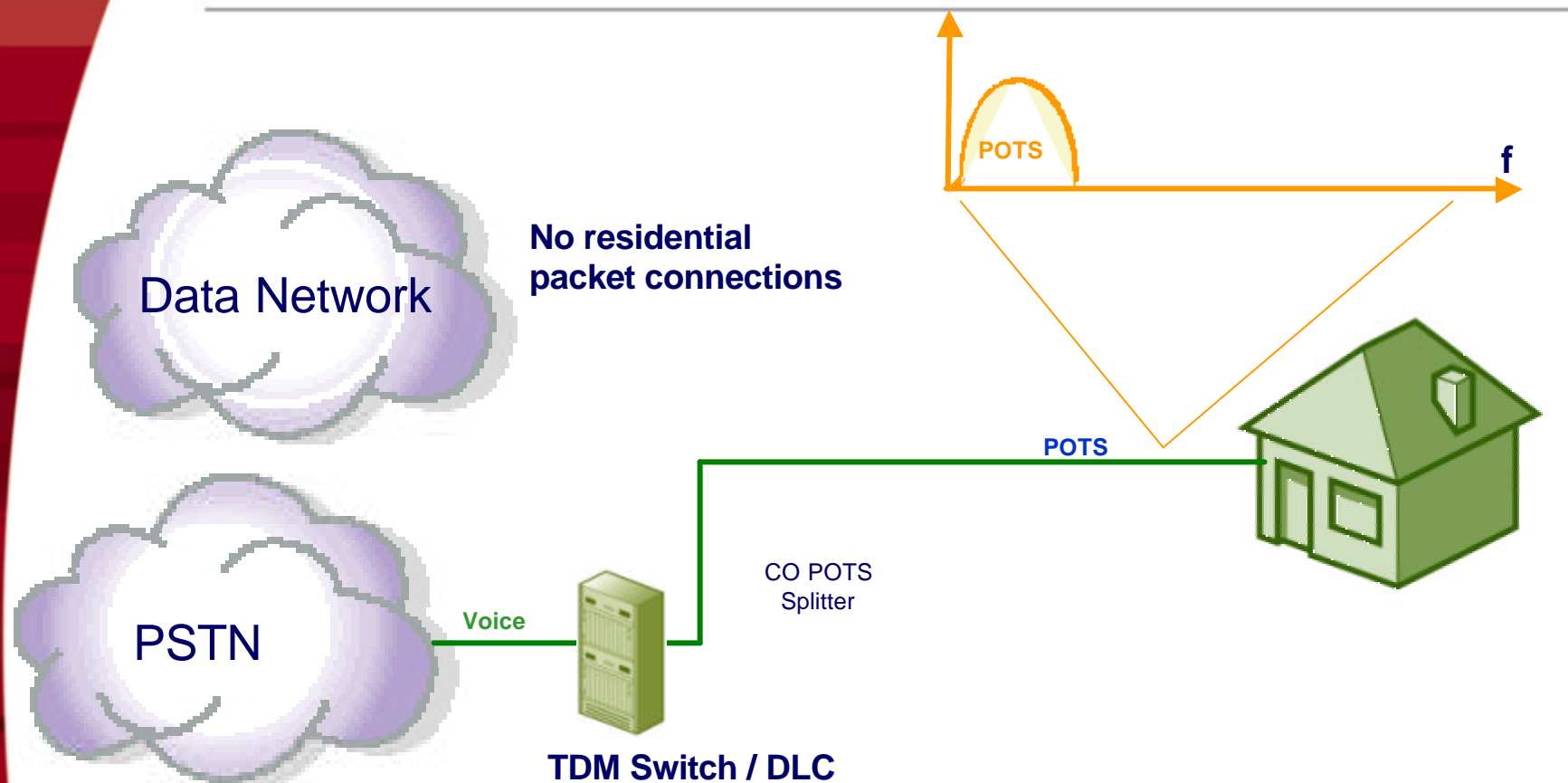
## 2 Simplify the Access Network

- Minimize CapEx
- Volume Provisioning (OpEx)

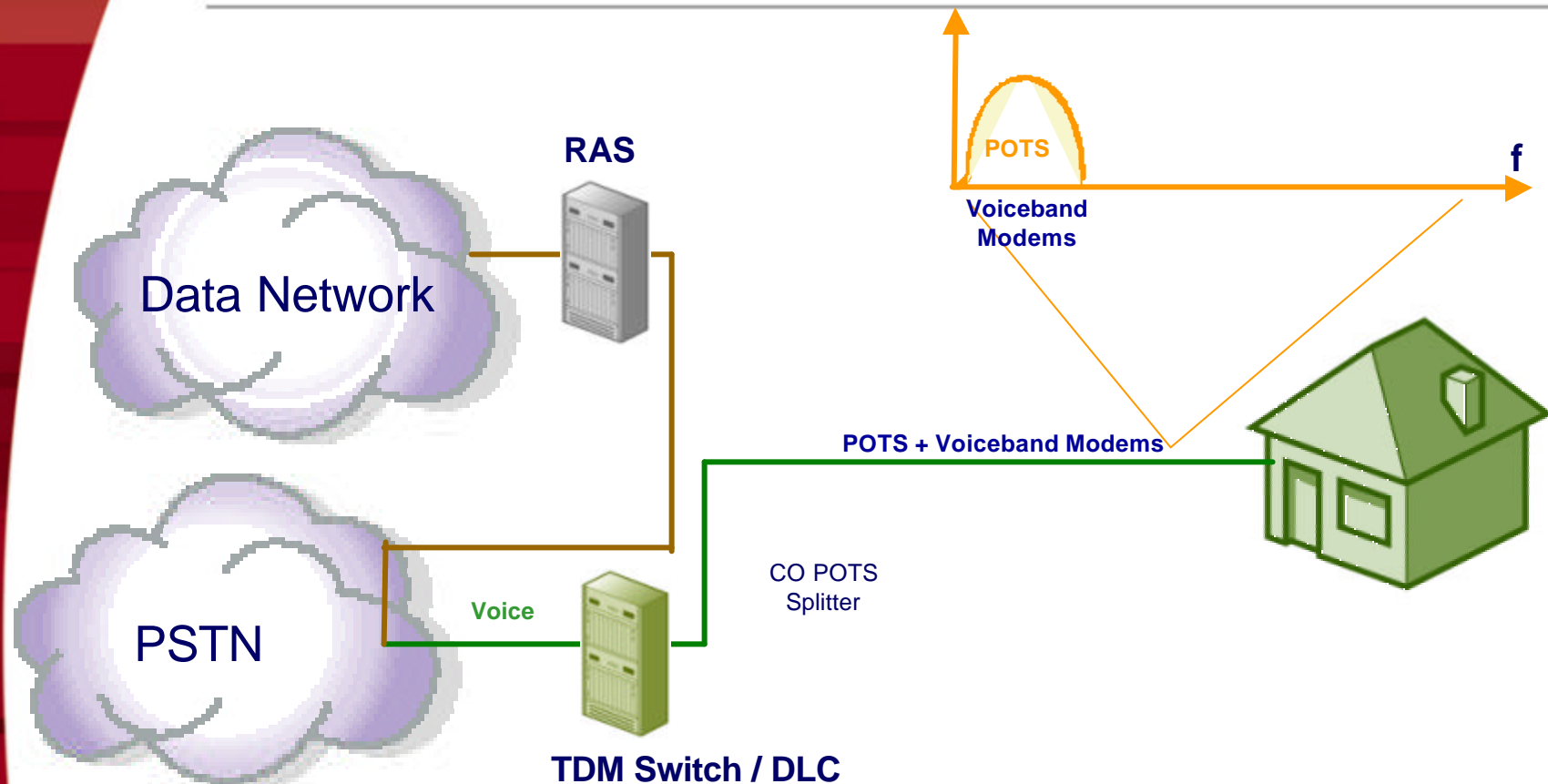
## 3 Ease the Transition to Packet

- Allow Carriers to migrate at their own pace

# In the Beginning

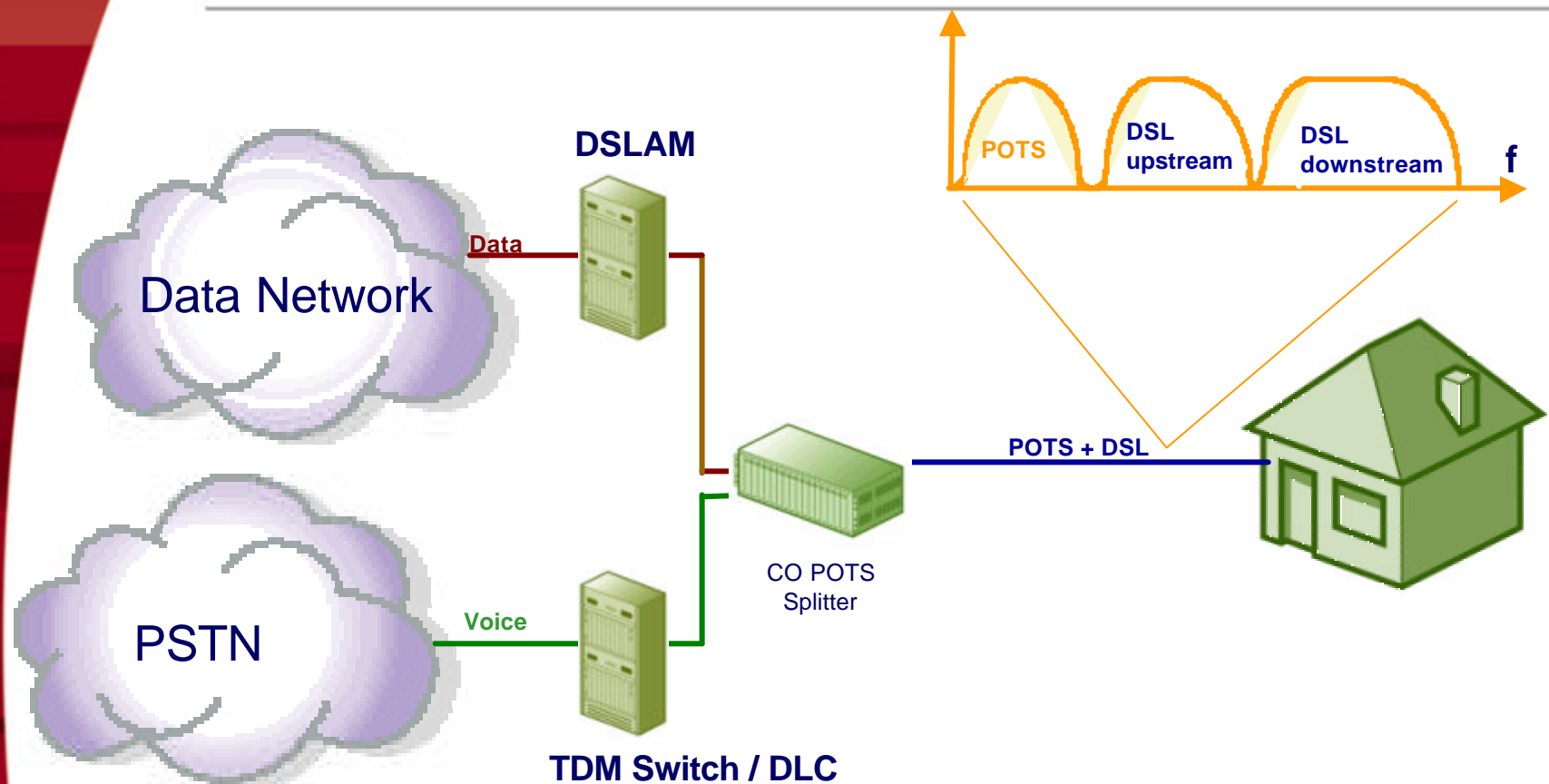


# Accessing the Data Network from the Voice Network

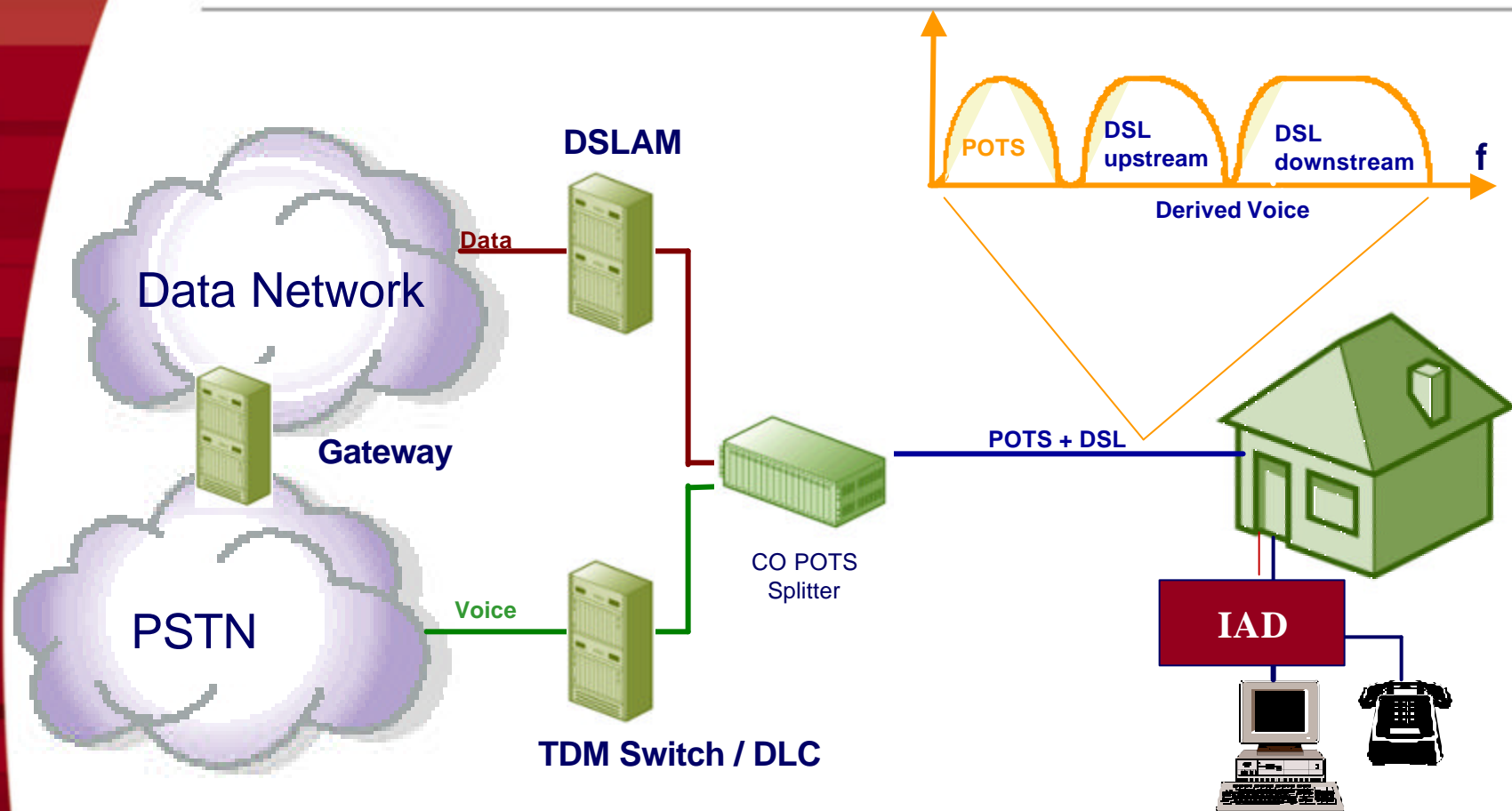


***"Data Call" travels thru the Voice Network to the Data Network***

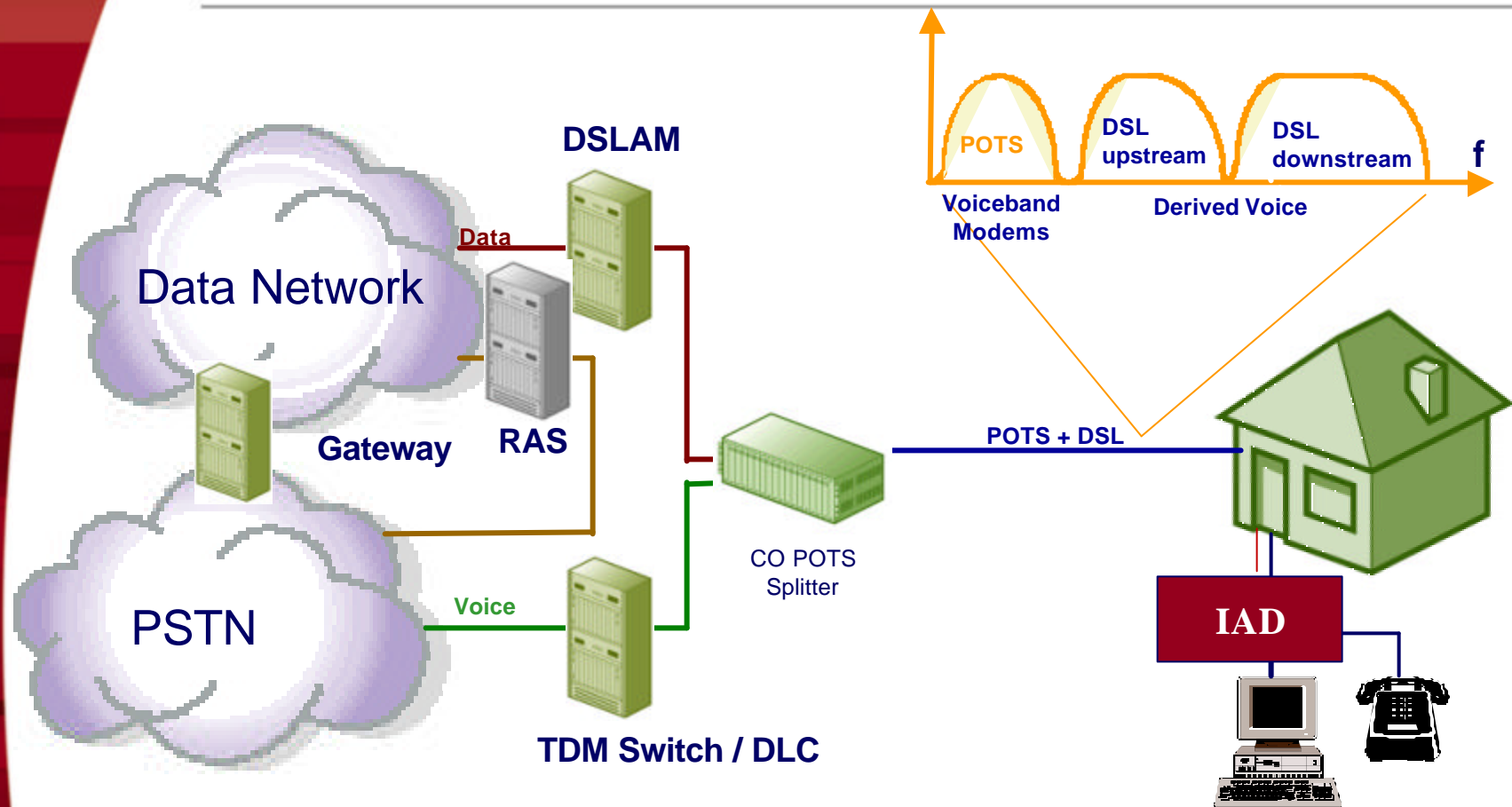
# The DSL Deployment Model



# Derived Voice thru the Data Network



# Not the Intended Architecture!





# What is the Ideal Architecture?

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## 1 Single Loop Termination

- Lifeline POTS & Broadband Services
- Leverage the existing copper plant infrastructure

## 2 Migration to Converged Packet-based Network

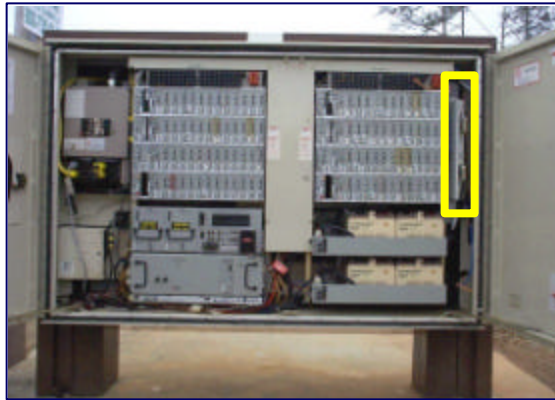
- Must support today's Legacy Network
- Seamless convergence of Voice and Data

## 3 High Bandwidth Capable

- Shorter Loops = More Bandwidth
- Move Electronics closer to the Home

# Attempting a DSLAM Overlay

Mini-Ram



**Space constrained**

**Tough to install**

**Not scaleable - supports  
8-16 DSL lines maximum**

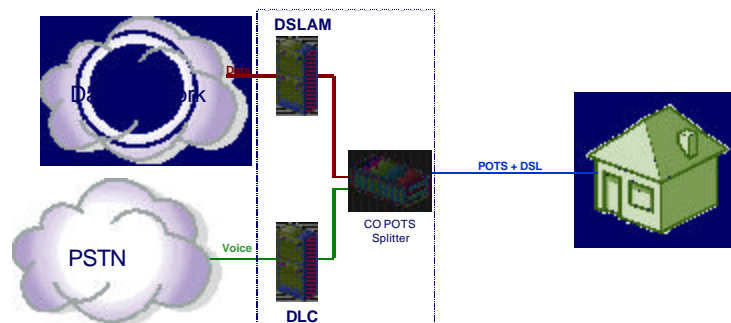
Remote DSLAM



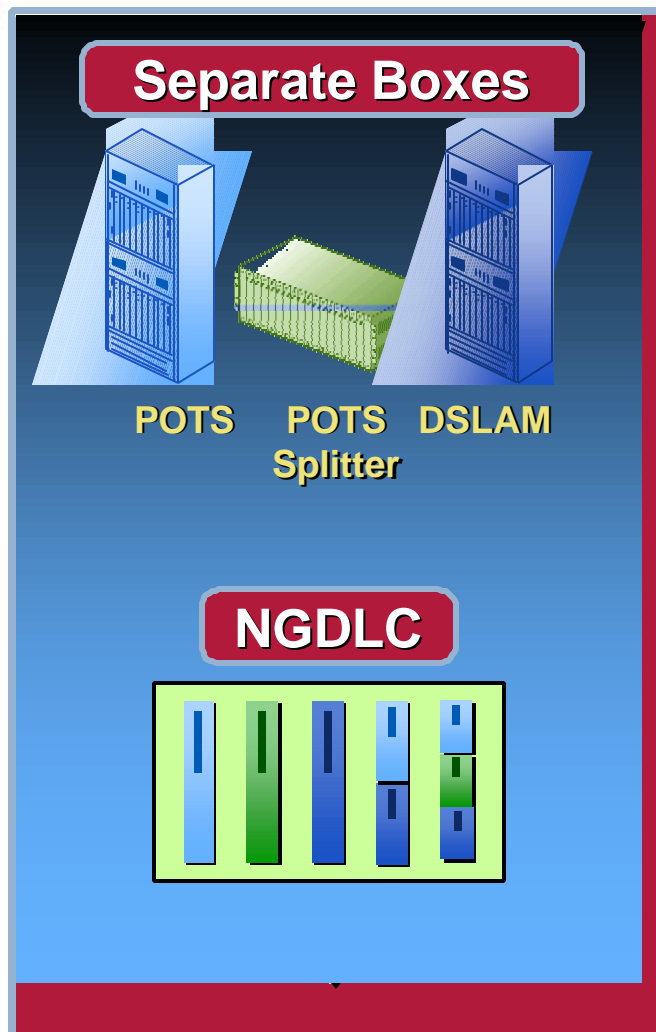
**Significant capital and  
operational cost**

**“Easement” issues**

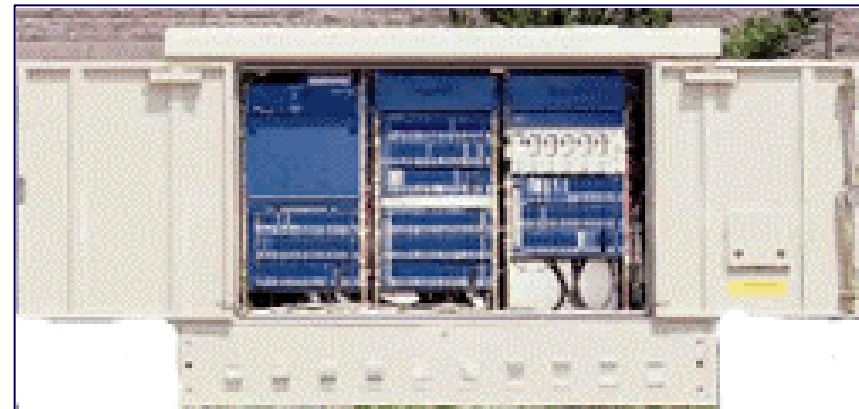
**Construction lead-time**



# Integrated Overlay on a Line Card



## NGDLC



Significant Improvement vs Overlay DSLAM  
Still too costly for “volume” DSL  
Lose POTS Capacity  
“Integrated POT Splitters”

# Mass Integration Required

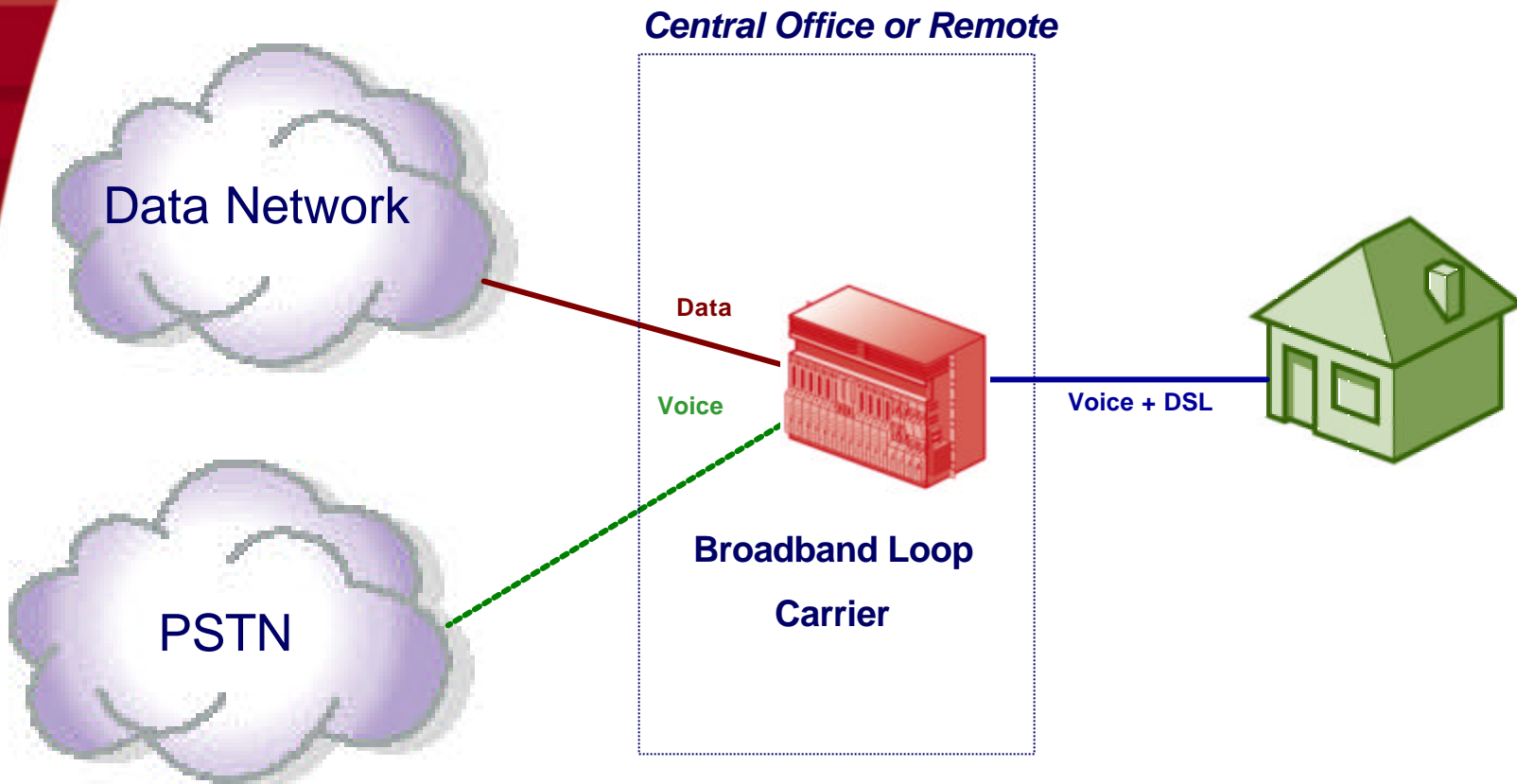


## Broadband Loop Carrier

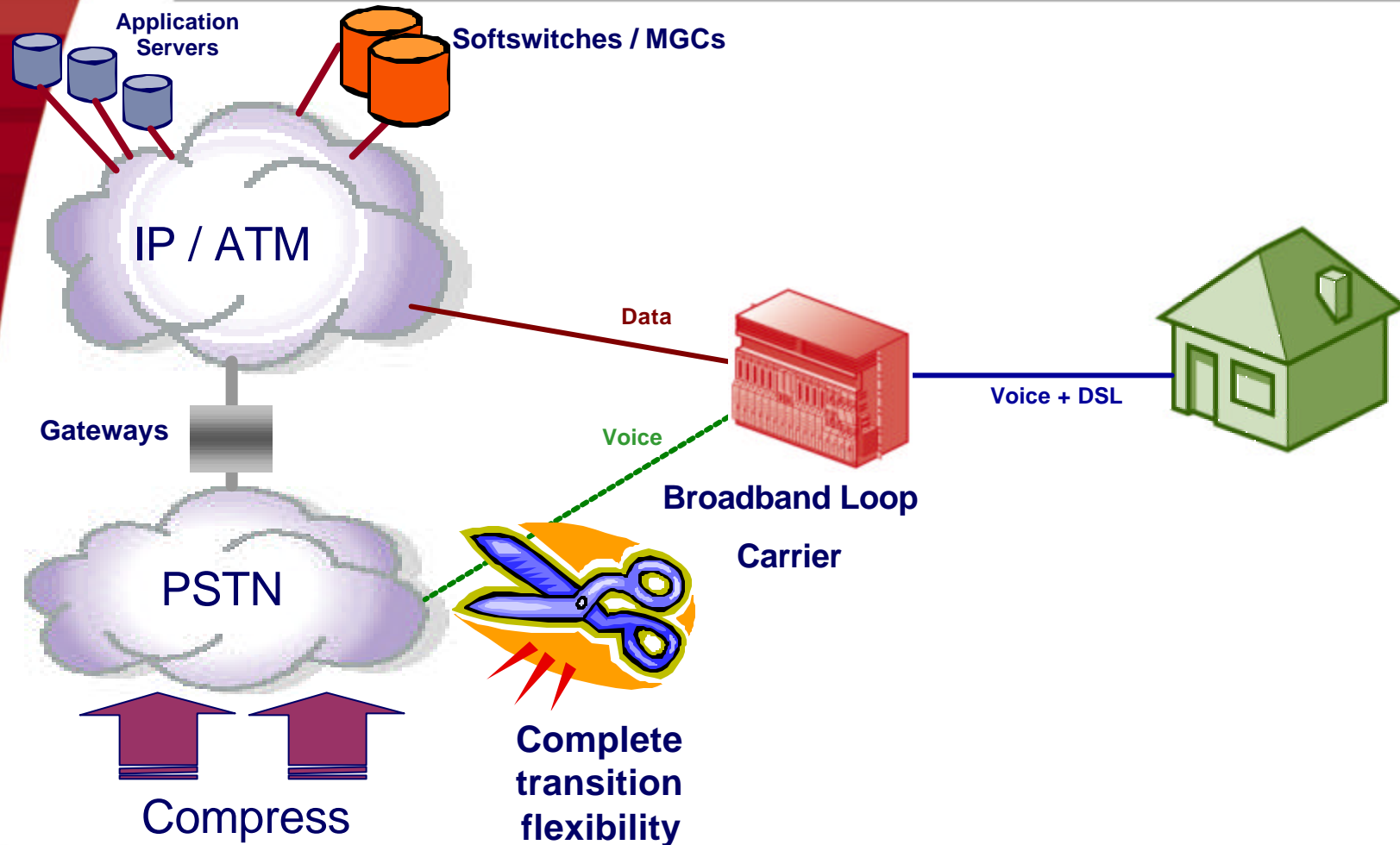


**POTS + DSL on every port**  
**Full Spectrum Connectivity**  
**Full Convergence of Voice and Data**  
**Industry Breakthrough in**  
**- Power, Cost, Density**

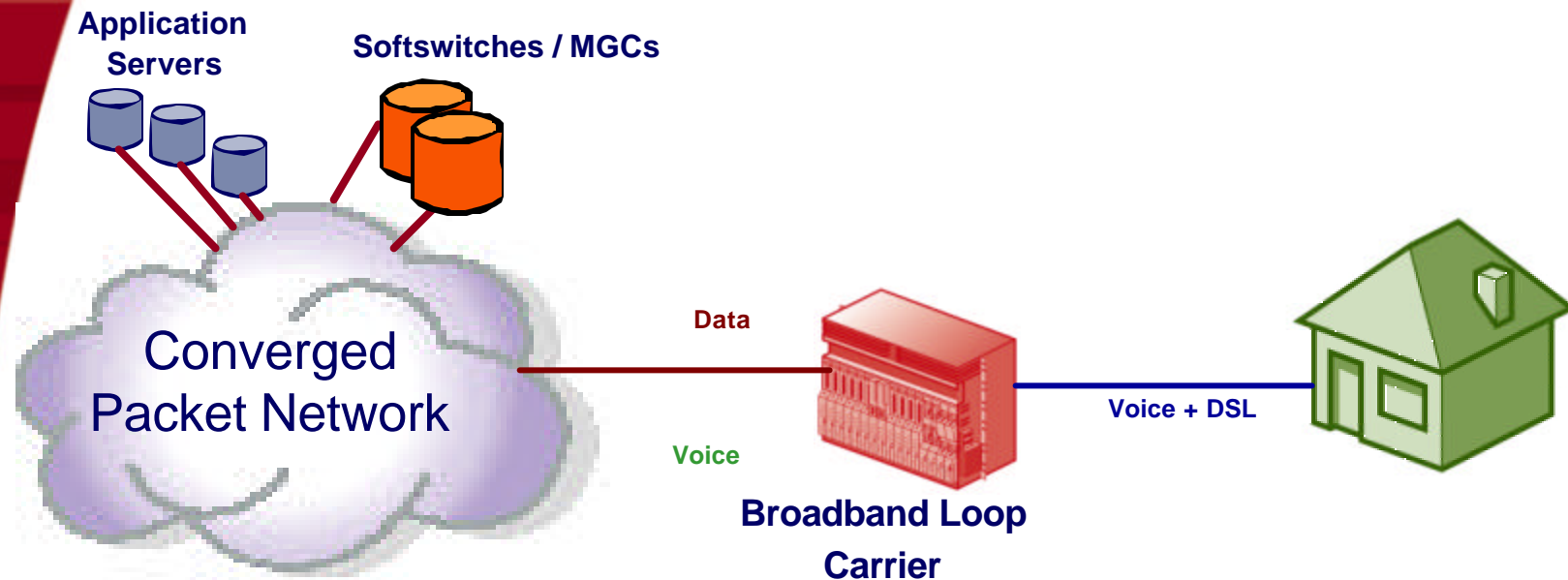
# Emerging Broadband Deployment Model



# Access Network Dynamics

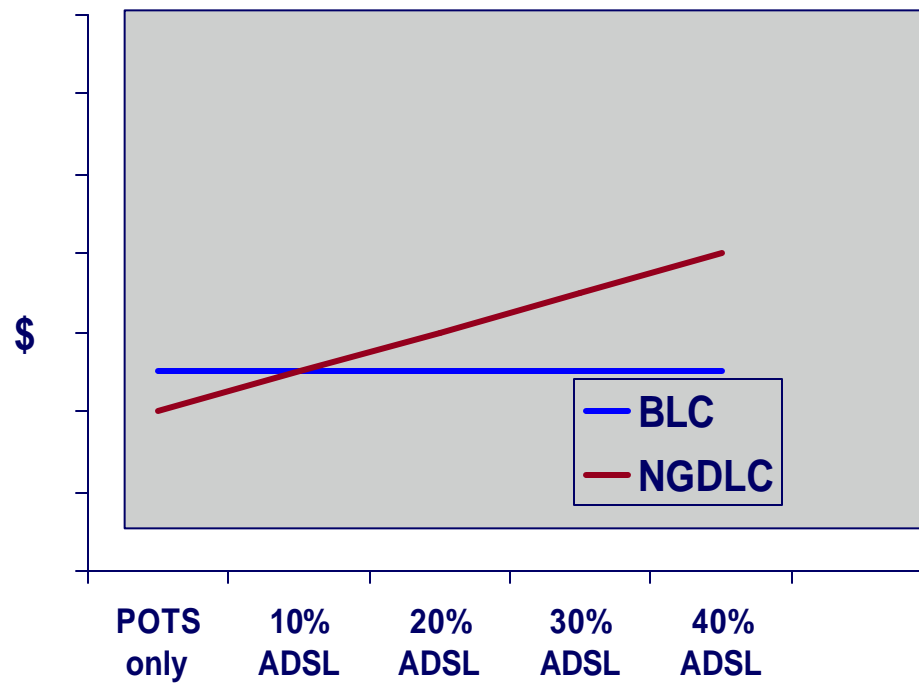


# Access Network Dynamics



# CapEx

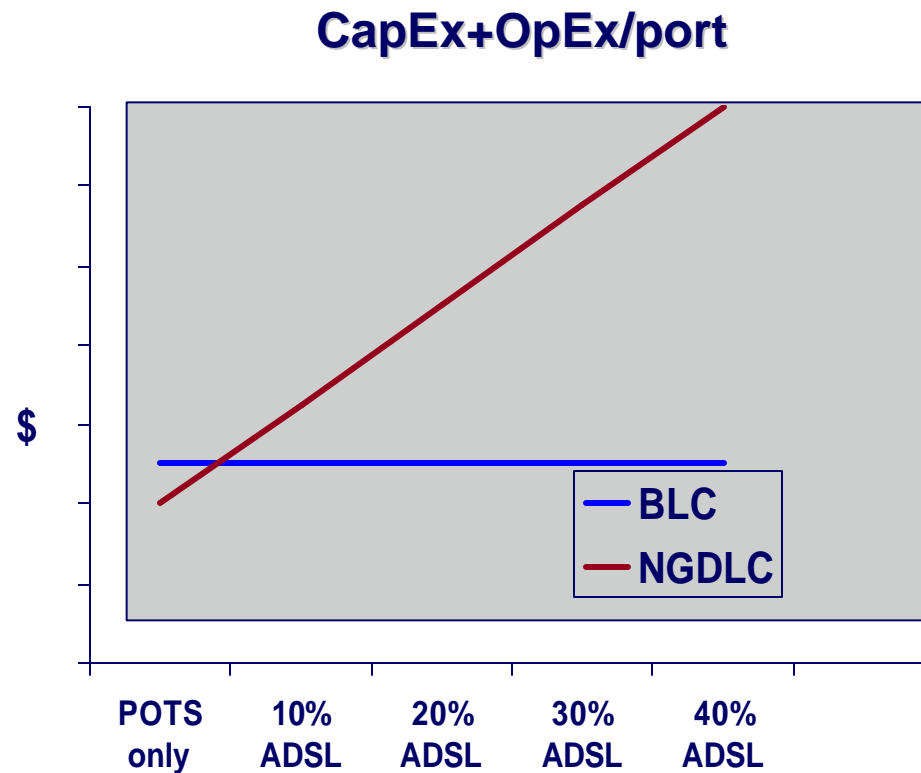
## CapEx/port



Notes: Assumes 1000 Line Location, Truck Rolls = \$250



# CapEx + OpEx



Notes: Assumes 1000 Line Location, Truck Rolls = \$250

# Broadband Loop Carrier

- **POTS and DSL on every port**
  - Remote DSL provisioning
  - Accelerates DSL Availability
- **Line by line migration to converged packet-based network**
- **Integrates functions of:**
  - DSLAM
  - DLC
  - Media Gateway



**Broadband Loop Carrier**

# Summary

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## **Integrated POTS + DSL solutions enable**

- **Universal DSL Deployment**
  - Addresses economic deployment barriers in rural and suburban areas
- **Speeds DSL deployment to all areas**
  - All subscriber loops become broadband capable

## **Increasing Speed and Breadth of Deployment Are Critical**

- Innovation and investment stall in face of uncertainty
- Solutions for today should not impede innovations of tomorrow

***Enable mass deployment of broadband***

# Conclusions

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- **National Broadband Policy is in FCC hands**
  - State PUCs should assist in, not “undo,” FCC policy
  - Imposing state-specific rules hinders multi-state networks
- **US stands to lose entire generation of innovation, investment**
  - Uncertainty cripples carrier desire to deploy, reach consumers
  - Policies that encourage “free riders” deter any facilities-based investment: ILEC, CLEC, cable
  - Increasingly, money for IT is flowing overseas (Asia) and time is critical
- **Not asking for incentives, but *removal* of disincentives**
  - Relevant market is broadband market – let platforms fight out in market
  - FCC policies can and should encourage cooperation, not litigation
- **Let's reach the consumers not yet served, give consumers more choice among providers, platforms, and go for the long run benefits.**

**Everyone** wants  
**Broadband™**

**Thank You**

